

Fun Math Problems - Part 1

*These problems are mostly from my high school math teacher, **Prof. Lajos Posa** who is a well known mathematician/math teacher in Budapest. It is difficult to find words that describe his talent and dedication. So I just let the problems speak for themselves.*

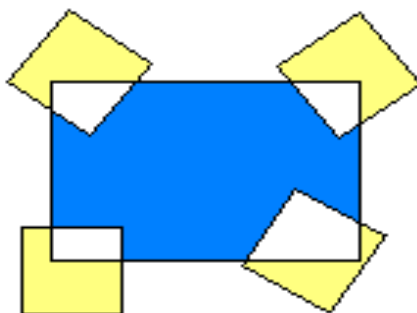
1. Mr and Mrs Brown are having a party. They invited three other married couples, so there are eight people present. When greeting each other, some people shake hands with some people. Of course, nobody shakes hands with his/her spouse. When Mr Brown asks the other seven people: "How many people did you shake hands with?", he receives seven different answers. How many people did Mrs. Brown shake hands with?

Solution

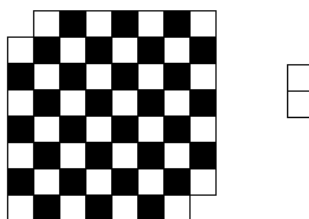
2. A king has his birthday. So he decides to let go some of his prisoners. He actually has 100 prisoners at the moment. They are each in a separate cell, numbered from 1 to 100. Well, he is a high tech king. He can close or open any prison door by a single click on the cell's number on his royal laptop. When he clicks at a locked door, it opens. When he clicks at an open door, it locks. At the beginning, every door is locked. First the king clicks on every number from 1 to 100 (therefore opening every door). Then he clicks on every second number from 1 to 100, (i.e. 2, 4, 6, 8, 10,...). Then he clicks on every third number. And so on. Finally, he only clicks on the number 100. Then he orders that the prisoners that find their door open may go free.

Who gets to go and who has to stay?

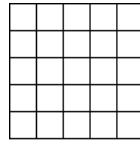
3. The picture below shows a rectangle (the sides' length are 2 and 3 unit long) and four identical squares (sides' length are 1). Determine which area is greater: the yellow or the blue?



4. We have a chess board with two corners missing, as indicated on the picture below. We also have 31 pieces of domino, each of them can cover exactly 2 fields on the chess board. Is it possible to cover the chessboard with the domino pieces?



5. We have a 5x5 board as the picture below shows. So happens, on each one of the fields there is a ladybug sitting. Suddenly, each decides to move to a neighboring field. (Two fields are neighbors if they have an edge in common.) Is it possible that after each have moved there is again exactly one lady bug sitting on each field?



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If you have any questions, you can ask me at mhidegkuti@ccc.edu